DOCUMENT RESUME

ED 224 434 HE 015 766

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TITLE A Path Analytic Model of the College Going Decision.
INSTITUTION Appalachian State Univ., Boone, N.C.
PUB DATE [81]
NOTE 18p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Academic Ability; *Academic Aspiration; *College Attendance; *College Bound Students; Decision Making; *Enrollment Influences; Grades (Scholastic); Higher Education; *High School Seniors; Noncollege Bound Students; *Path Analysis; Predictor Variables; Race; Socioeconomic Status
IDENTIFIERS High School and Beyond (NCES)

ABSTRACT

Factors that affect the decision of a high school senior to attend or not to attend college were studied, using a path analysis model. Data were drawn from the 1980 High School and Beyond national survey of 58,000 high school sophomores and seniors, which was sponsored by the National Center for Education Statistics. The study sample was 14,287, or 52 percent of the High School and Beyond seniors. The Statistical Package for the Social Sciences and eight multiple regression analyses were performed. Four important predictors of college attendance plans were found: socioeconomic status, high school grades, academic ability, and race. The two most important predictors were grades and ability; socioeconomic status was found to have an indirect effect through its influence on grades and ability. A nonwhite student was more likely to plan to attend college than a white student with similar grades, ability, and socioeconomic status. Initially, the theoretical model included the variables of father's and mother's education, family income, and sex. However, father's and mother's education and family income were found to be a part of the socioeconomic status composite. (SW)

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A PATH ANALYTIC MODEL OF THE COLLEGE GOING DECISION

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A PATH ANALYTIC MODEL OF THE COLLEGE GOING DECISION

There is considerable apprehension and concern about the future of higher education in the United States over the next decade as the traditional college going cohort of 18-24 year olds begins to decline. Projections indicate that by 1990 a decrease in this age group of 15 percent from the 1981 peak year is expected {2}. If the college going rate, the proportion who attend college, for this age group remains unchanged from past years, American colleges and universities must anticipate sharp enrollment declines for this cohort. Any major changes in the college going rate over the next decade will impact these projections significantly.

The purpose of this study is to model the variables that affect the decision of a high school senior to plan or not to plan to attend college. This decision, the college going decision, is primarily motivated by four factors: the desire of the student to preserve or enhance social status, the economic return the student can expect from a college education, the attractiveness of the college life, and socio-economic conditions {4}. The early research in this field has been done by sociologists and economists. Sewell et al. have found that socio-economic status, parental encouragement, teacher encouragement, friends' encouragement, academic performance, and mental ability all increase the likelihood that a student will attend college {11, 12, 13}. Barnes found that the variables which most affect a high school graduate's decision to attend college are his prior academic achievement, the prices of competing colleges, and the combined income of his parents {1}.

He found that variables which least influenced the college going decision were race, sex, family size, and number of older siblings in college. None of these studies were able to use the large national stratified random data sets currently available. This study will use such a data base, High School and Beyond, to examine the college going decision.

The Data Base

The data were drawn from the High School and Beyond (HSB) national survey of 58,000 high school sophomores and seniors conducted in 1980 by the National Opinion Research Center of the University of Chicago. HSB was sponsored by the National Center for Educational Statistics and is the successor to the National Longitudinal Study begun in 1972. The HSB survey contains a broad range of biographical, personal, attitude, aptitude, and other information on the 1980 sample. A detailed description of the sample, instruments, and data collection procedures can be found in the High School and Beyond {8}. The sample used for this study was all high school seniors in the HSB data set with complete information on the variables selected for study. This procedure resulted in a study sample of 14,287 or 52 percent of the HSB seniors.

Variables

Seventeen variables, classified into six categories, were examined in this study.

1. Race: coded 2 for white and 1 for all others. The sample was 85 percent white with all others comprising the remaining 15 percent.

2. Family Background: consisted of eight variables classified into four categories of father's education, mother's education, family income, and socioeconomic status (SES). Father's and mother's education variables were coded as follows: did not complete high school = 2; high school graduate = 3; less than two years of vocational education = 4; two years or more of vocational education = 5; less than two years of college = 6; two or more years of college = 7; bachelor's degree = 8; master's degree = 9; and Ph.D., M.D., or other advanced professional degree = 10. Family income was coded as a discrete variable ranging from 1 through 7 with $6,999 or less = 1 and $38,000 or more = 7. The SES variable was the standard composite index computed by HSB based on parent's education, occupation, and income and the presence of the following in the household: daily newspaper, encyclopedia, typewriter, electric dishwasher, two or more cars and/or trucks, more than 50 books, a room of your own, and a pocket calculator.
3. Sex: coded as male = 1 and female = 2. The sample was 48 percent male and 52 percent female.
4. Academic Ability: the scores from five HSB standardized tests. A mean score was computed from the two vocabulary tests, the two mathematics tests, and the reading test for each sample subject. Each test was standardized to a mean of 50 and standard deviation of 10.
5. High School Grades: coded as eight discrete categories ranging from mostly A's = 8 to mostly below D = 1.

6. College Going Decision: subjects who indicated that they planned to attend college were coded 2. Subjects who indicated that they did not plan to attend college or did not know if they would attend college were coded 1. Seventy-four percent indicated that they planned to attend college.

Analysis of the Data

Path analysis was used to test a theoretical causal model for the college going decision (Figure 1). Race was the origin of the hierarchical model since it precedes the other exogenous variables in time. Arrows hypothesizing a weak, causal ordering were drawn from race to the other variables. In similar fashion the exogenous variables, family background, sex, academic ability, and high school grades were included in the model. The focus of the study, the college going decision, was the endogenous variable for the model {5}. An arrow drawn from variable A to variable B does not necessarily indicate a strong causal relationship between A and B, but rather that if such a relationship does exist the direction is from A to B and not the reverse {10}.

Using the SPSS statistical package {9} and the computer facilities of Duke University and the University of North Carolina General Administration, a simple correlation matrix for the variables studied was computed (Table 1). Eight multiple regression analyses were performed to compute the standardized regression or path coefficients (Table 2). To determine if any path coefficients were to be deleted, the criterion of meaningfulness rather than significance was used because the significance criterion is questionable when using large samples {3}. As a result of this analysis, father's education, mother's education, family income, and sex were deleted from the model. New path

Figure 1. Path Model for the Study of the College Going Decision

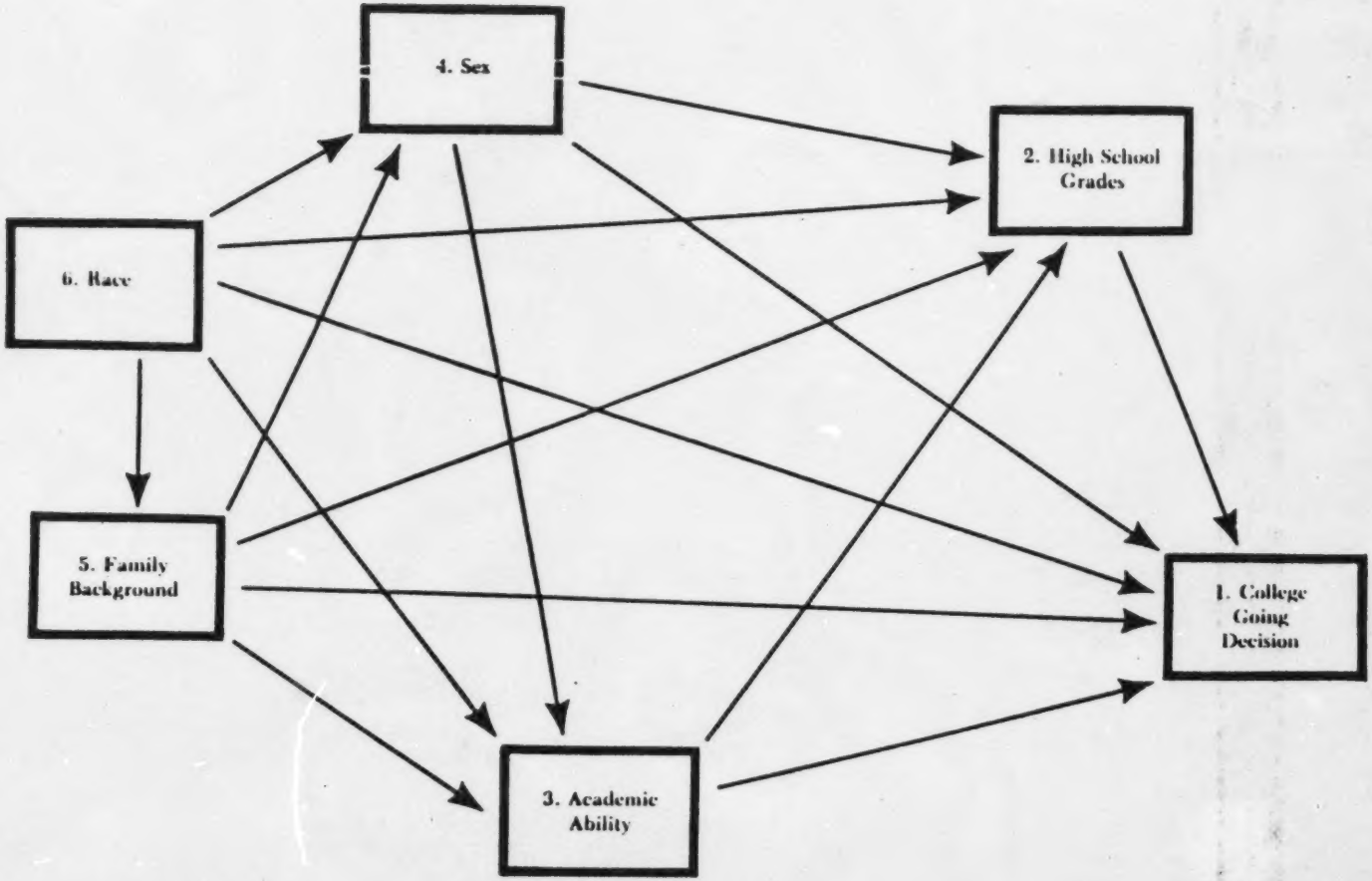

Table 1. Correlation Coefficients

		R	FE	ME	FI	SES	S	AA	HSG	CGD
Race	(R)	1.000	.130	.072	.198	.225	-.018	.227	.094	-.058
Father's Education	(FE)		1.000	.551	.408	.793	-.057	.370	.174	.283
Mother's Education	(ME)			1.000	.330	.704	-.042	.316	.160	.242
Family Income	(FI)				1.000	.691	-.091	.283	.103	.174
Socioeconomic Status	(SES)					1.000	-.081	.435	.196	.304
Sex	(S)						1.000	-.097	.171	.059
Academic Ability	(AA)							1.000	.498	.345
High School Grades	(HSG)								1.000	.321
College Going Decision	(CGD)									1.000

Note: $N = 14,687$; $p < .001$ for all $r \neq -.018$; and $p < .05$ for $r = -.018$.

Table 2. Standardized Regression Coefficients for the College Going Model

Dependent Variable		Independent Variable								
		R	FE	ME	FI	SES	S	AA	HSG	R^2
Father's Education	(FE)	.130**								.017
Mother's Education	(ME)	.072**								.005
Family Income	(FI)	.198**								.039
Socioeconomic Status	(SES)	.225**								.051
Sex	(S)	.004	-.004	.010	-.064**	-.042				.009
Academic Ability	(AA)	.144**	.083**	.044**	-.013	.309**	-.064**			.214
High School Grades	(HSG)	-.017*	-.003	.015	-.025*	-.002	.220**	.528**		.297
College Going Decision	(CGD)	-.165**	.062**	.010	-.015	.179**	.061**	.198**	.182**	.212

Note: N = 14,687; * indicates $p < .05$; and ** indicates $p < .01$.

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coefficients were computed for the reduced model (Table 3). Examination of Tables 2 and 3 indicates that the reduced model explains almost as much variance as the original full model. Since the deleted paths made negligible contributionsto the model, their deletion is desirable in order to have a more parsimonious model {7}. The reduced model correlations were then decomposed into direct causal, indirect causal, and noncausal components (Table 4) following the procedures suggested by Kerlinger and Pedhazur {6}.

Findings

The coefficient of determination (R^2) for the reduced model was .206 as compared to .212 for the original full model. Race, SES, academic achievement, and high school grades explain about the same amount of variation in the college going decision as the full model.

Race

Race had a direct inverse relationship with the college going decision, i.e., non-whites were more likely to say they planned to attend college than whites. However, decomposition of the covariation revealed that race had a positive indirect effect on the college going decision when transmitted through SES, academic ability, and high school grades. Race is positively related to both SES and academic ability and they in turn are positively related to the college going decision. When the effect of race is transmitted through these two variables, the indirect effect is that more whites indicate that they plan to attend college. The direct covariation, however, is stronger than the indirect so the effect of race on the college going decision is that more non-whites than whites anticipate college attendance. When the effects

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Table 3. Standardized Regression Coefficients for the Reduced College Going Model

Dependent Variable	Independent Variable				
	R	SES	AA	HSG	R^2
Socioeconomic Status (SES)	.225				.051
Academic Ability (AA)	.136	.404			.206
High School Grades (HSG)	-.017	-.022	.511		.249
College Going Decision (CGD)	-.169	.222	.187	.201	.206

Note: N = 14,687; $p < .01$ for all $r \neq -.017$; and $p < .05$ for $r = -.107$.

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Table 4. Decomposition of the Bivariate Correlations With the College Going Decision

Type of Relation	Related Variables			
	High School Grades	Academic Ability	Socioeconomic Status	Race
(A) Original Correlation with College Going Decision	.321	.345	.304	-.058
(B) Causal - direct	.201	.187	.222	-.169
Causal - indirect	.000	.103	.113	.111
Total Causal	.201	.290	.335	-.058
(C) Noncausal Covariation	.120	.055	-.031	.000

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of race are transmitted through SES and academic ability, however, more whites plan to attend college.

Family Background

Father's and mother's education had a small direct effect on the college going decision but this effect is primarily a part of the SES composite. Parent's education is positively related to academic ability which strongly affects the college going decision. Family income also had little direct effect on the college going decision except as a part of the SES composite. Family income is positively related to academic ability which in turn affects the college going decision. It is interesting to note that the availability of monies from the family appears to have little impact on the decision of whether or not to attend college.

The socioeconomic status of the family has a direct impact on the college going decision of the children. SES directly accounts for 6.8 percent of the variation (path coefficient X correlation coefficient) in the college going decision. SES's strong relationship with academic ability accounts for the indirect influence of SES on the college going decision.

Sex

The sex of the student is not related to the college going decision. There is a positive relationship between sex and high school grades, i.e., females get higher grades than males, and high school grades do positively influence the college going decision.

Academic Ability

Higher scores on the vocabulary, mathematics, and reading tests

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were positively related to the college going decision. Those students with strong academic ability are more likely to plan to attend college. Academic ability is also strongly related to high school grades which also influences the college going decision.

High School Grades

High school grades have a direct, positive effect on the college going decision. Students with high grades are more apt to anticipate college attendance than those with low grades.

Discussion and Summary

From the variables examined, four are important predictors of whether a high school senior plans to attend college: socioeconomic status, high school grades, academic ability, and race. A reduced model of these four variables explained 21 percent of the variation in the college going decision. The model for predicting the college going decision is as follows:

College Going Decision = .06283 (High School Grades) + .00001019 (Academic Ability) + .0001365 (Socioeconomic Status) - .2069 (Race) + 1.226

By setting high school grades, academic ability, and SES to the average values for this sample, a probability model by race can be constructed. Based on this model the probability that a non-white student with average grades, ability, and SES will plan to attend college is .91 while the probability for a white student with similar characteristics is .70, i.e., a non-white high school senior with average high school grades, academic ability, and SES is more likely to plan to attend college than is a white student with identical grades, ability, and SES. When the same model is used with high school grades and academic ability

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reduced one standard deviation while SES remains at the sample mean value, the same trend continues. Given a white and a non-white high school student with high school grades and academic ability both one standard deviation below the mean and with average SES, the probability is greater that the non-white student (probability = .74) plans to attend college than that the white student (probability = .53) plans to attend. In fact it is more likely that a non-white with grades and ability one standard deviation below the mean will plan college attendance than that a white student with average grades and ability will plan to attend.

Policy Implications

The purpose of this study was to determine what factors influence the decision of high school seniors to plan to attend or not to attend college. The finding that the two most important predictors are high school grades and academic ability was expected and welcome. One would hope that the best students would choose to attend college. The socioeconomic status of the student was found to impact on the college going decision but not to the extent of high school grades and academic ability, However, SES was found to influence the college going decision indirectly through its influence on grades and ability. The most surprising result regarded the impact of race. A non-white student is more likely to plan to attend college than a white student with similar grades, ability, and SES. One possible conclusion to this finding is that some white students are not planning college attendance who perhaps should do so. With anticipated future declining college enrollments, this conclusion leads to a pool of previously untapped potential students. It must be noted, however, that this study dealt only with

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those high school students who indicated they planned to attend or did not plan to attend college. As subsequent HSB data becomes available, this study will be extended to examine those students who actually did or did not attend college.

References

1. Barnes, Gary. "Determinants of the College Going Decision." An unpublished paper, 1972.
2. Dearman, Nancy B., and Valena White Plisko. The Condition of Education. Washington, D.C.: National Center for Educational Statistics, 1980.
3. Heise, D.R. Causal Analysis. New York: John Wiley and Sons, 1975.
4. Jackson, Gregory A. "Financial Aid and Student Enrollment." Journal of Higher Education, 49 (1978), 548-74.
5. Kenny, David A. Correlation and Causality. New York: John Wiley and Sons, 1979.
6. Kerlinger, F.N. and E.J. Pedhazur. Multiple Regression in Behavior Research. New York: Holt, Rinehart and Winston, 1973.
7. Munro, Barbara. "Dropouts from Nursing Education." Nursing Research, 29 (1980), 371-77.
8. National Opinion Research Center. High School and Beyond. Chicago: University of Chicago, December, 1980.
9. Nie. N.H. et al. (Editors). SPSS: Statistical Package for the Social Sciences (Second Edition). New York: McGraw-Hill, 1975.
10. Page. Ellis B. and Timothy Z. Keith. "Effects of U.S. Private Schools: A Technical Analysis of Two Recent Claims." Educational Researcher, 10 (1981), 7-17.

11. Sewell, William H., Archibald O. Halles, and George W. Ohlendorf. "The Educational and Early Occupational Status Attainment Process: Replication and Revision." American Sociological Review, 35 (1970), 1014-27.

12. Sewell, William H., Archibald O. Halles, and Murray A. Straus. "Social Status and Educational and Occupational Aspiration." American Sociological Review, 22 (1957), 67-73.

13. Sewell, William H. and Vimal P. Shah. "Social Class, Parental Encouragement, and Educational Aspirations." The American Journal of Sociology, 73 (1968), 559-72.

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